

LA.2 & LB.2 SERIES

Continuously Variable Power Supplies

Instruction Manual



Coutant Electronics Ltd.

CONTENTS

	Page
Introduction	1
Specification	1 & 2
Operating Instructions	4
Input Connections	4
Constant Voltage Operation.....	4
Constant Current Operation.....	5
Circuit Description	5 & 6
Remote Sensing (LB.2 only)	7

ILLUSTRATIONS

Fig. 1. Primary Tap Connections	3
Fig. 2. Remote Sensing Connections	7
Circuit Diagram	8

Introduction

LA.2 & LB.2 series Power Supplies provide a continuously variable, highly stable output in both constant current and constant voltage modes.

Voltage and current levels are accurately set by multiturn potentiometers and continuously monitored on separate moving coil meters.

Units may be worked in series in the constant voltage mode and in parallel in the current mode and into any type of load.

Specification

Constant Voltage Mode

Mains Regulation: ($\pm 10\%$ mains change)

$\pm 0.01\% + 1\text{mV}$.

Output Impedance:

D.C. Less than 5 milliohms

100 KHz

Less than 200 milliohms

500 KHz

Less than 500 milliohms

Ripple Voltage:

0.005% + 0.5mV peak to peak

Transient Response:

Less than 10 microseconds for recovery to within 10mV of steady state voltage after application of full load.

Constant Current Mode

Mains Regulation: ($\pm 10\%$ mains change)

$\pm 0.01\% + 1\text{mA}$.

Load Regulation:

0.03% + 3mA zero to full load

Ripple Current:

0.01% + 1mA peak to peak

0.05% + 5mA peak to peak

(LB.2 only)

Temperature Range:	-10°C to +45°C.
Temperature Coefficient:	Less than 0.02%/°C
Input Voltage:	105 – 125 or 220 – 240V at 45 to 400 Hz by transformer tap changes. Maximum permissible input supply deviation from nominal $\pm 10\%$.
Input Termination:	3 – core flying lead.

Unit Type	Voltage Range	Max Current	Height	Width	Depth	Weight
LA100-2	0–50V	1 AMP	8½"	5 $\frac{1}{8}$ "	9½"	12 lbs
LA200-2	0–30V	2 AMP				
LA400-2	0–15V	4 AMP	216mm	143mm	242mm	5.5Kg.
LB200-2	0–50V	2 AMP	8½"	5 $\frac{1}{8}$ "	13½"	24 lbs
LB500-2	0–30V	5 AMP				
LB1000-2	0–15V	10 AMP	216mm	143mm	344mm	11Kg.

Operating Instructions

Before switching input power to the unit check that:—

1. The A.C. fuse is correctly rated and is an anti-surge device. (LA.2 :- 200 – 250V I/P 1 AMP, 100 – 125V I/P, 2 AMP. LB2:- 200 – 250V I/P 3A, 100 – 125V I/P 5 AMP.
2. The transformer primary taps are set to within $\pm 10\%$ of the nominal. The unit is set to 240 volts before despatch unless otherwise specified by the customer.

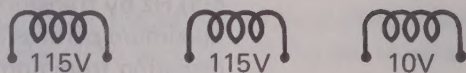
The primary of the transformer is arranged as two 115 volt windings and a 10 volt winding to which soldered connections are made. The two 115 volt windings are connected in series for voltages 220 – 240 and in parallel for voltages 105 – 125, the 10 volt winding being connected in phase or anti-phase to add or subtract 10 volts. See Fig. 1.

Access is gained to the transformer by removing the four feet of the unit, loosening the 4 front panel retaining screws and removing the cover.

Fig. 1.

Transformer Primary Tap Connections

The primary is arranged as three windings:—



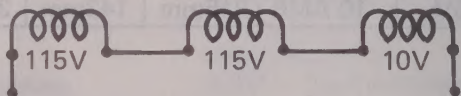
The 115V windings are connected in series for input voltages of 220 — 240V and in parallel for voltages of 105 — 140V.

The 10 volt winding is connected in series in phase or anti-phase to add or subtract 10 volts.

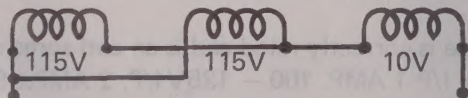
Examples:

10 volts connected in phase.

240V A.C.
input

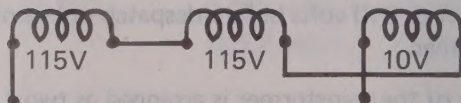


125V A.C.
input



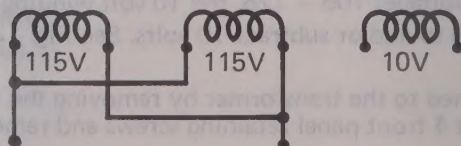
10 volts connected in anti-phase

220V A.C.
input



10 volts not connected

115V A.C.
input



IMPORTANT

A dial is provided on the rear panel to indicate the voltage at which the unit is set. Be sure to re-set the dial if it becomes necessary to alter the input voltage taps.

Input Connections

Connect the flying input lead to a suitable 3 pin plug using the colour code, green/yellow — earth, brown — line and blue-neutral.

Controls

Three main controls are provided.

Volts

A multiturn potentiometer control which sets the output voltage, the level of which is shown on the top meter.

'On-Off'

A rotary switch controlling the mains supply to the unit.

'Amps'

A multiturn potentiometer control which sets the current level at which the unit will enter into constant current operation. The current level is indicated on the bottom meter.

Operation: Constant Voltage Output

Turn the voltage control to minimum (fully anti-clockwise) and the current control to maximum (fully clockwise). Connect input power to the unit and turn the front panel rotary switch to 'On'.

Connect the load to the output terminals and adjust the voltage to the required level. The unit will remain in constant voltage operation unless the load resistance is so reduced that the current demand exceeds the capacity of the unit. The output will then enter into the constant current mode and the voltage will fall to maintain a constant current output.

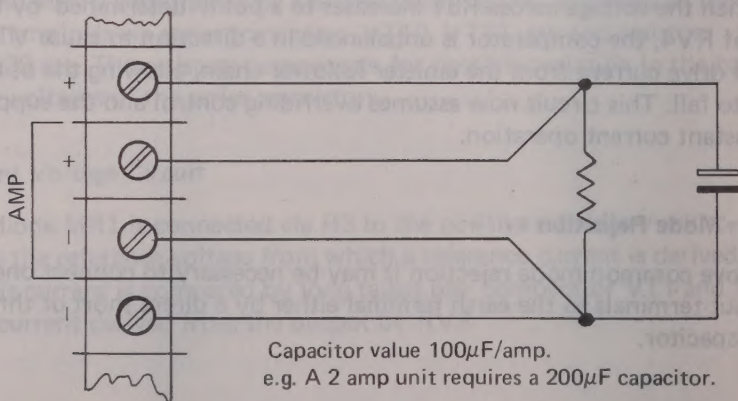
REMOTE SENSING (LB.2 Series only)

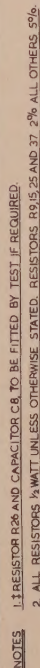
The effect of voltage drop across long leads due to their resistance, can be overcome by removing the links between the amplifier and output rails and connecting the amplifier terminals to the load by separate leads. The correct voltage will then be maintained across the load (Fig. 2).

Note:

1. An electrolytic capacitor of approximately $100\mu\text{F}/\text{amp}$ can be connected across the load to compensate for the inductance of the leads and thus reduce the high frequency impedance.
2. The sensing leads must be routed carefully to avoid A.C. pick-up. Screened leads may be necessary.
3. Keep the resistance of the leads as low as possible.
4. On very long leads it may be necessary to remove the output capacitor from the unit to improve the high frequency response of the amplifier.
5. NEVER remove the power leads from the load with the sensing leads still connected. This may burn out the low value resistors connected between the sensing and output rails in the unit.

Fig. 2 Remote Sensing Connection





UNIT	'X' - 'X'	C2	C5a	C5b	C6a	C6b	R1	R8	R14	R28-31	R36	RV3	MR9/10	MR11	V19	V19-B
LA 1002	48+0-48+	00/160v	2,800/100v	—	150/70v	—	2 Ka	43 Ka	470n	1a x 3	1n	20 Ka	IN4003 x 2	IN4003	2N4347 x 3	2N4347 x 3
LA 2002	31+0-31v	00/160v	9,000/50v	—	50/35 v	—	15 Ka	43 Ka	470n	5a x 3	5n	10 Ka	IN4502 x 2	2N4355	2N4355 x 3	2N4355 x 3
LA 4002	21+0-21v	00/160v	5,000/50v	—	50/35 v	—	15 Ka	43 Ka	470n	5a x 3	25n	10 Ka	IN5402	2N4355	2N4355 x 3	2N4355 x 3
LB 2002	48+0-48+	003/160v	2,000/100v	2,000/100v	150/70v	—	2 Ka	43 Ka	470n	1n x 3	25n	20 Ka	IN5402 x 2	IN5402	2N4347 x 6	2N4347 x 6
LB 5002	31+0-31v	00/160v	9,000/50v	—	50/35v	—	—	68 Ka	470n	5a x 4	1a	10 Ka	PM7A2Q	IN5402	2N4355 x 8	2N4355 x 8
LB 10002	21+0-21v	00/160 v	9,000/50 v	9,000/50 v	500/35v	—	15 Ka	82 Ka	1K n	25n x 4	05n	5 Ka	PM7A2Q	IN5402	2N4355	2N4355 x 8

LA.2 & LB.2 CIRCUIT DIAGRAM.

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